Bureau of Land and Water Quality
Division of Watershed Management
Industrial Stormwater Program

DRAFT Standard Operating Procedure
Guidelines For Visual Monitoring of Stormwater Discharges Associated With Industrial Activities.

1. **APPLICABILITY.** This Standard Operating Procedure (SOP) applies to all industrial facilities covered under the Maine Multi-Sector General Permit (MSGP) for Stormwater Discharges Associated with Industrial Activity regardless of the facility's industrial sector code. All permitted facilities are required to perform quarterly visual monitoring of their stormwater discharges associated with industrial activity as part of their Stormwater Pollution Prevention Plans (SWPPP) in order to achieve compliance with the Multi-Sector General Permit.

2. **PURPOSE.** To provide guidelines for standardized methods for sample collection and visual examination of industrial stormwater discharges for indicators of stormwater pollution as defined in Part V of the Maine MSGP. To provide guidelines describing standardized methods of data recording and record keeping of all quarterly visual stormwater discharge monitoring data. These guidelines are described in Part 5 of the MSGP.

3. **DEFINITIONS.**

3.1. Multi-Sector General Permit (MSGP) A general permit for Stormwater Discharges Associated with Industrial Activities. Authorizes the direct discharge of stormwater associated with industrial activity to waters of the State other than groundwater, provided the discharge meets the requirements stated in this permit. This permit is effective October 11, 2005 and expires October 11, 2010. It replaces EPA's MSGP for Industrial Activities issued October 30, 2000.

3.2. SWPPP. Stormwater Pollution Prevention Plan. A plan developed and implemented by each industrial facility. It outlines sources of potential stormwater pollutants and the methods by which these pollutants will be reduced or prevented from entering waters of the State. The Plan identifies in writing a SWPPP team of facility personnel as well as a SWPPP team leader who is ultimately responsible for SWPPP implementation.

3.3. GRAB SAMPLE. Sample of stormwater discharge taken as a single uninterrupted event (i.e., grabbed at one time) from a single stormwater outfall from the industrial facility. The sample may be collected manually or with an automatic sampler.

3.4. OUTFALL. Any location such as a ditch, rill, pipe, storm drain, boat ramp, or detention pond exit where shallow concentrated flow of stormwater leaves an industrial facility.

3.5. MEASURABLE STORM EVENT. Any storm event that yields at least 0.1 inch of precipitation.

4. RESPONSIBILITIES.

4.1. MONITORING PROGRAM IMPLEMENTATION. The schedule for performing visual examinations should be clearly documented in the facility's SWPPP. The permittee must perform and document a quarterly visual examination of industrial stormwater discharges from each outfall which discharges stormwater associated with industrial activity from the facility.

4.2. OUTFALL IDENTIFICATION. The permittee must identify each industrial stormwater outfall at the facility. All outfalls shall be clearly identified on the facility site map which is part of the facility's SWPPP and also listed in the written text of the SWPPP.

4.3. EMPLOYEE TRAINING. The permittee is responsible for ensuring that all facility personnel involved in stormwater sampling are properly trained to do so. Staff involved in sampling should:

a. Be familiar with the site map and outfall locations
b. Walk the site to physically identify each sampling location
c. Become familiar with local rainfall and drainage patterns
d. Learn proper procedures for measuring rainfall
e. Become competent with proper sample collection procedures

Personnel involved in sampling should also be trained in all facility safety procedures as they apply to stormwater sampling. Where practicable the same individual should carry out the collection and examination of discharges for the entire permit term. Written documentation signed by the SWPPP team leader certifying that all personnel involved in sampling have been properly trained should be maintained onsite with the SWPPP.

4.4. SAMPLE COLLECTION FREQUENCY. Visual examinations of industrial stormwater discharges must be performed once per monitoring quarter. If no measurable storm event resulted in discharge from the facility during a monitoring quarter, the permittee is excused from visual monitoring for that quarter provided the permittee documents in the monitoring records that no runoff occurred. Schedule of monitoring quarters is listed below.

- First: October 1 to December 31
- Second: January 1 to March 31
- Third: April 1to June 30
- July 1 to September 30

All other time specific sampling requirements are to be performed in accordance with the parameters outlined in the procedures section of this document.

4.5. RECORD KEEPING AND REPORTING. The permittee must maintain reports of all visual examinations conducted onsite with the SWPPP. The permittee is not required to submit visual examination results to DEP unless specifically asked to do so. Requirements for recording visual examination data are outlined in the procedures section of this document.

5. PROCEDURES

5.1. MEASURING RAINFALL. All facilities required to perform visual monitoring of industrial stormwater discharges should have a rain gauge on site for measuring rainfall. The rain gauge may be a standard rain gauge, tipping bucket gauge, weighing type gauge, float recording gauge, or any other National Weather Service approved device for measuring rainfall to the nearest 0.1 inch. To minimize measurement errors, the gauge should be placed on a level surface that is not windswept and is away from trees or buildings that might interfere with the path of rainfall. The gauge should be regularly inspected by sampling personnel to ensure that it is in good working order and capable of accurately measuring rainfall to the nearest 0.1 inch.

5.2. SAMPLE COLLECTION TIMING. A grab sample must be collected from each facility outfall during a measurable storm event that occurs at least 72 hours from the previously measurable storm event. The 72 hour interval is waived when the preceding measurable storm did not yield a measurable discharge. During a measurable storm event, a grab sample for visual examination should be collected during the first 60 minutes or as soon thereafter as practicable, but not to exceed 2.25 hours of when runoff begins discharging from areas of exposed industrial activity. During monitoring quarters when snowmelt represents the only stormwater discharge, a grab sample must also be collected during periods of significant snowmelt within the first 60 minutes or as soon thereafter as practicable, but not to exceed 2.25 hours) of when snowmelt begins discharging from areas of exposed industrial activity. Stormwater runoff from employee parking lots, administration buildings, and landscaped areas that is not mixed with stormwater associated with industrial activity, or stormwater discharges to municipal sanitary sewers does not need to be sampled.

5.3. SAMPLE CONTAINER CLEANING AND PREPARATION. The facility should have an adequate supply of containers prepared for collection of industrial stormwater samples from each outfall prior to collecting samples for visual examination. All sample containers used for sampling for visual examination should be certified as clean and free of residue by the container manufacturer, or cleaned according to the following procedure.

5.3.1. Wash containers in a non-phosphate detergent and tap water wash.

5.3.2. Thoroughly fill and rinse containers with tap water at least three (3) times.

5.3.3. Store containers closed, and in an area free of dust and other potential sample contaminants.

5.3.4. If additional containers are needed to collect samples from less accessible outfalls (i.e. buckets which are attached to poles for reaching outfalls), these containers should also be cleaned and prepared as indicated above.

5.4. SAMPLE COLLECTION. Samples shall be examined in clear glass or clear plastic container prepared and cleaned as indicated above, so that all visual monitoring criteria can be observed.

5.4.1. MANUAL GRAB SAMPLE COLLECTION. Manual grab samples should be collected by inserting a container under or downstream of a discharge with the container opening facing upstream, and with the opening of the container completely immersed under water, whenever possible. Small containers (ideally 250 ml to 750 ml or approximately 8 to 24 ounces in size) are recommended in order to be able to submerse the container opening under water while still collecting an adequate sample size to make a correct visual inspection. In most cases the sample container can be held in hand while the sample is collected. Less accessible outfalls may require the use of poles and buckets to collect grab samples. Take the grab from the horizontal and vertical center of the outfall. If sampling in a channel, (i.e., ditch, trench, rill) avoid stirring up bottom sediments. Avoid touching the inside of the container to prevent contamination. Transfer sample to a clear glass or plastic container if using another container such as a bucket to collect a sample from a less accessible location. If taking samples from multiple outfalls, label containers with outfall identification prior to taking samples. Make sure samples are securely capped until examination.

5.4.2. COLLECTION OF GRAB SAMPLES BY AUTOMATIC SAMPLER. Facilities which use automatic samplers for stormwater sampling may collect grab samples for visual examination by this method. Programming for collecting grab samples is specific to the type of automatic sampler. All facility personnel who collect stormwater samples using automatic samplers should be properly trained in operation of the sampler before doing so. Several different types of automatic samplers are available for stormwater sampling. However, the following guidelines should be followed when sampling regardless of the type of sampler used. All equipment must be properly cleaned, particularly the tubing and sample containers. Deionized water should be drawn through the sampler to remove any residuals prior to taking samples. Tubing should also be periodically replaced to avoid algae or bacterial growth. Additionally, a distilled/deionized water blank sample should be taken at each outfall sampled to determine if contamination of stormwater samples by the sampling equipment has occurred. Samplers should be used in exact accordance with the manufacturers' instructions. All sampler calibration and maintenance data should be kept on site with the SWPPP.

5.5. SAMPLE EXAMINATION. Visual examination of all grab samples collected must be performed within the first sixty (60) minutes (or as soon thereafter as practicable, but not to exceed 2.25 hours) of when the runoff or snowmelt begins discharging from the facility. Collect the samples and bring them to a well lit indoor area. Pour each sample into a separate 1 L polycarbonate plastic graduated Imhoff cone. The cone should have graduations that allow volume measurement to the nearest milliliter. Record the total sample volume to the nearest milliliter on the visual monitoring form. Examine the samples for the following criteria according to the instructions provided with the visual monitoring form: Foam, odor, clarity, floating solids, settled solids, suspended solids, color, oil sheen, and any other obvious indicators of stormwater pollution. It is also recommended that a sample of tap water be collected in the same type of container used to collect the samples and used as a comparison to aid in evaluating the samples for the criteria stated above.

*Note: Clear polycarbonate plastic Imhoff cones are available from several scientific supply companies. See section 6 for a list of suppliers.

5.6. SAMPLE DATA RECORDING. Record all sample data on the visual monitoring form (Attachment B) after examining the sample for all of the criteria listed in the instructions (Attachment A). The form should include the examination date and time, examination personnel, the nature of the discharge (i.e., rain or snowmelt), identification of outfall sampled, quality of the stormwater discharge (including observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and any other obvious indicators of stormwater pollution), and probable sources of any observed contamination. The permittee must sign and certify the documentation in accordance with Part VII (E) of the Maine MSGP. All visual examination reports must be maintained on site with the SWPPP.

5.7. RECOMMENDATIONS FOR SOLVING SAMPLE LOCATION PROBLEMS. Consult guidelines listed below when it is necessary to sample an outfall located at a less than ideal location for sampling.

- PROBLEM: Sampling where stormwater comingles with process or non process water.
  RECOMMENDATION: Attempt to sample the stormwater discharge before it mixes with the non-stormwater discharge. If this is impossible, sample the discharge both during dry and wet weather and maintain a record of the visual examination data observed under both conditions on site with the SWPPP. This will provide an indication of the contribution of any observable contamination from each source.

- PROBLEM: Numerous small point channels make up an outfall from which it is difficult to collect a sample.
  RECOMMENDATION: Impound channels or join their flow together by building a weir or digging a ditch to collect discharge at a low point for sampling. This artificial collection point should be lined with plastic to prevent infiltration and/or high levels of sediment.

- PROBLEM: Inaccessible discharge point (examples include underwater discharges or unreachable discharges (e.g., out of a cliff).
  RECOMMENDATION: Go up the pipe to sample (i.e., to the nearest manhole or inspection point). If these are not available, tap into the pipe, or sample at several locations upstream of the pipe if the pipe is the only outfall for the facility.

- PROBLEM: Managing multiple sampling sites to collect grab samples during the first 60 minutes of a measurable storm event.
  RECEMMONDATION: Have a sampling crew ready for mobilization when forecasts indicate a measurable storm event is likely to occur. If this is not possible, sample missed outfall locations during other measurable storm events.

- PROBLEM: Commingling of parking lot runoff with discharge associated with industrial activity.
  RECOMMENDATION: The combined runoff must be sampled at the discharge point as near as possible to the industrial activity or at the parking lot drain inlet if there is one.

- PROBLEM: Sampling in manholes
  RECOMMENDATION: Sample with a collection device on the end of a pole to reach stormwater. Personnel sampling in manholes should have confined space safety training if manhole has to be entered.

- PROBLEM: Run-on from other property.
  RECOMMENDATION: If possible, collect and examine a sample of the stormwater at the border of the property where the run-on occurs. Then, collect and examine a sample of the stormwater at a facility outfall downstream of the run-on point. Note any observable differences between the samples and maintain the documentation with the SWPPP.

- When confronted with other difficult sampling scenarios not addressed above, the permittee should consult DEP for guidance on how to best address the situation.

6. REFERENCES

6.1. GUIDANCE MANUAL FOR THE MONITORING AND REPORTING REQUIREMENTS OF THE NPDES MULTI-SECTOR STORM WATER GENERAL PERMIT
United States Environmental Protection Agency, Office of Water (EN-336), EPA 833-B-99-001(January, 1999)

6.2. NPDES STORM WATER SAMPLING GUIDANCE DOCUMENT
United States Environmental Protection Agency, Office of Water (EN-336), EPA 833-8-92-001 (July, 1992)

6.3. STATE OF MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION MULTI-SECTOR GENERAL PERMIT MAINE POLLUTANT DISCHARGE ELIMINATION SYSTEM STORMWATER DISCHARGE ASSOCIATED WITH INDUSTRIAL ACTIVITY
Maine Department of Environmental Protection, Bureau of Land and Water Quality, Waste Discharge License # W-008227-5Y-A-N (October 11, 2005)

***Notes: List of Vendors that Supply One Liter (1L) Clear Polycarbonate Imhoff Cones**

Forestry Suppliers Inc.
PO Box 8397
Jackson, MS 39284
(800) 752-8460
www.forestry-suppliers.com

Lab Safety Supply Inc.
PO Box 1368
Janesville, WI 53547-1368
(800) 356-0783
www.labsafety.com

Nalge Nunc International
International Dept.
75 Panorama Creek Dr.
Rochester, NY 14625
(800) 625-4327
www.nalgenelabware.com

Pollard Water
200 Atlantic Ave.
Hyde Park, NY 11040
800-437-1146
www.pollardwater.com